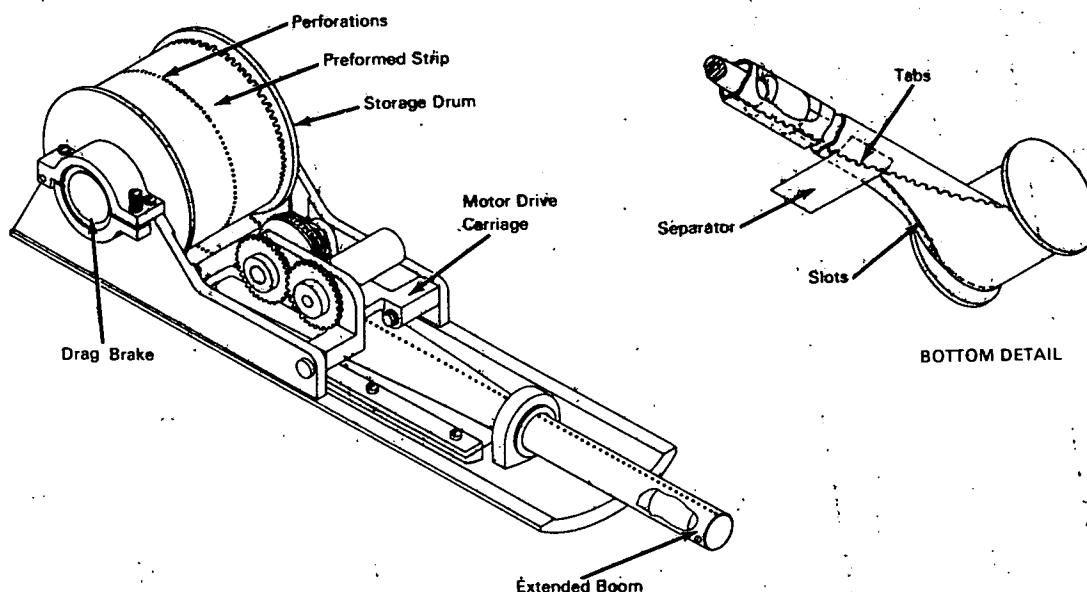


# NASA TECH BRIEF



NASA Tech Briefs are issued to summarize specific innovations derived from the U. S. space program and to encourage their commercial application. Copies are available to the public from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

## Sheet Metal Strip Unrolls to Form Circular Boom



### The problem:

To develop a retractable boom which can be extended for use as spacecraft antennas, gravity-gradients, and positioning devices.

A previous retractable boom (described in Tech Brief 64-10111, May 1964) was made from a strip of beryllium copper preformed into a cylindrical shape which was opened flat and wound on a storage drum. When unrolled from the drum, the beryllium copper strip would assume its preformed shape. The boom lacked torsional and flexural rigidity because it had a longitudinal slit that prevented the formation of a continuous circular cross section.

### The solution

A strip of metal that has a preformed cylindrical shape with tabs and slots on opposite edges. The strip is opened flat and coiled on a storage drum. When the strip is unrolled from the drum, the tabs interlock with the slots to form a cylindrical boom having a continuous circular cross section.

### How it's done:

The preformed strip is pulled off the drum by means of a sprocket feed mechanism. As the strip is pulled off the drum, it resumes its circular cross-sectional shape and engages a mandrel that ensures that the

(continued overleaf)

tabs enter and lock with the proper slots on the adjacent edge. A separator is used to place the tabs on the outside of the slots. The sprocket drive mechanism pulls the strip off the drum by means of a sprocket wheel that engages perforations in the center of the strip. The drum has a slight braking force applied to it so that the strip is pulled off under tension.

**Notes:**

1. The continuous circular cross section of the extended boom gives it torsional rigidity, bending strength, and orientation predictability.
2. Related innovations are described in Tech Briefs 63-10200, May 1964, and 65-10191, June 1965.

Inquiries may also be directed to:

Technology Utilization Officer  
Goddard Space Flight Center  
Greenbelt, Maryland, 20771  
Reference: B66-10032

**Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code AGP, Washington, D.C., 20546.

Source: Melpar, Inc.  
under contract to  
Goddard Space Flight Center  
(GSFC-423)